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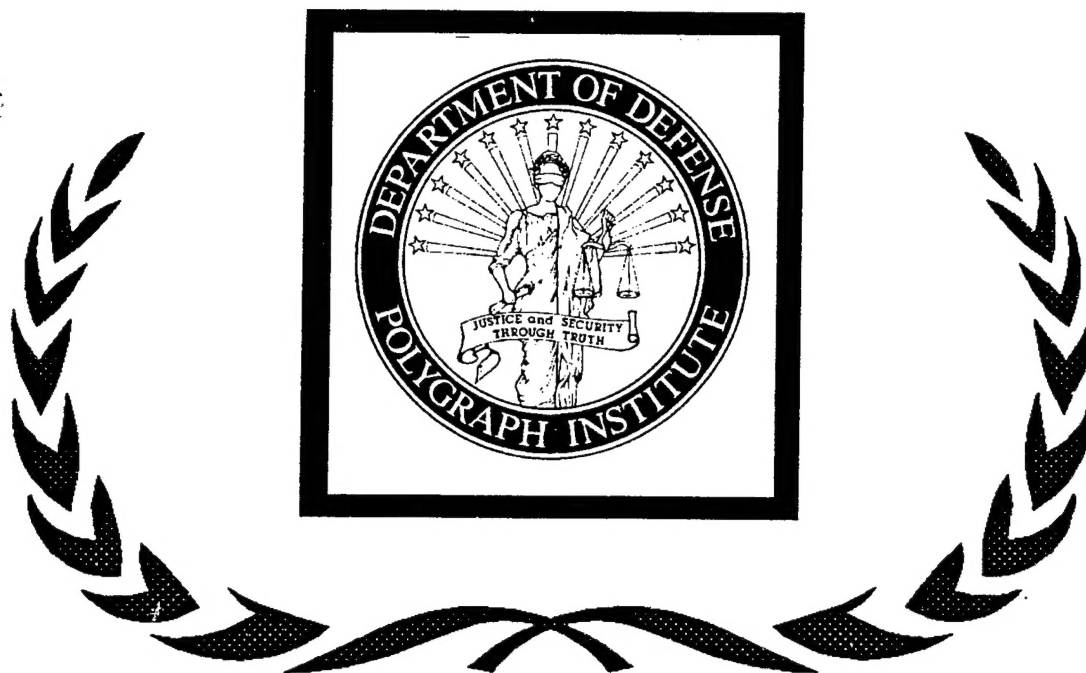
The Detection of Deception
for
Multiple Issues

Gordon H. Barland, Ph.D.
Charles R. Honts, Ph.D.
Steven D. Barger

January 1990

Report No. DoDPI90-R-0002

The Detection of Deception
for
Multiple Issues

Gordon H. Barland, Ph.D.,Charles R. Honts, Ph.D. and
Steven D. Barger

January 1990

Abstract

BARLAND, G .H., HONTS, C. R., and BARGER, S. D. <u>The Detection of Deception for Multiple Issues</u>. January 1990, Report No. DoDPI90-R-0002 Department of Defense Polygraph Institute, Fort McClellan, AL 36205.--The effectiveness of single issue and multiple issue psychophysiological detection of deception examinations was researched in an analog study conducted by the Department of Defense Polygraph Institute (DoDPI). Thirteen DoDPI instructors tested a group of 100 subjects who had been assigned to one of four conditions: (1) innocent, (2) guilty of one mock crime, (3) guilty of two mock crimes, or (4) guilty of three mock crimes. Half the subjects were tested with a multiple issue test format which contained questions about all three crimes under investigation. The remaining subjects were tested using a series of three single issue examinations, each containing questions about only one crime. Scoring rules taught at DoDPI were used by the original examiners to evaluate the tests. Overall, the differences in the correct identification of subjects when using the single or multiple approach were not statistically significant. The same was true when assessing performance between approaches for the innocent subjects and the guilty subjects. However, within each respective testing approach the differences between correct identification of innocent and guilty subjects were statistically significant. In addition to there being no advantage to using one testing approach versus the other, the primary finding of the study was that the common practice of breaking out relevant questions for further testing may result in misleading examination results.

Key words: polygraph examinations, multiple issue testing, single issue testing, polygraph accuracy, control question test.

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Polygraph examinations may cover one or many issues.
However, most of the scientific study of the polygraph has
concentrated on single issue exminations. A recent field study
(Raskin, Kircher, Honts, & Horowitz, 1989) found that the
accuracy of calls on single issues declined significantly when a
subject was truthful to some issues, but was deceptive to other
issues within the same multiple issue examination. Since the
government conducts many multiple issue examinations in both
criminal and screening settings we decided to examine the
validity of examinations conducted for multiple issues with an
analog experiment. Within this experiment subjects were assigned
to conditions so that they were either guilty of none, one, two,
or three crimes.

Method

The subjects were 94 male and 6 female enlisted trainees at
Fort McClellan. The average age of the subjects was 20.2 years.
Subjects were randomly asigned to one of four conditions. One
condition was an innocent condition and the other three were
guilty conditions. Subjects assigned to the first guilty
condition enacted one of three possible acts of espionage or
sabotage. Subjects assigned to the second guilty condition
enacted two of the three possible acts, and the remaining guilty
subjects enacted all three mock crimes.

The polygraph examinations were conducted by 13 instructors
from the Defense Polygraph Institute. During their polygraph
examinations, subjects were treated as if they were criminal
suspects. A stimulation (number) test was administered before
the first chart. Two different types of polygraph examinations
were administered. Half of the subjects were tested with three
single issue examinations, and half were given one multiple issue
examination. Single issue subjects were given three single issue
control question tests, one after the other. Each test covered
one crime and consisted of three repetitions of the questions.
The question series used with the single issue subjects are shown
in Figure 1. The sequence in which the crimes were covered was
systematically varied to control for possible sequence effects.
The multiple issue test administered to the remaining subjects
used the same six relevant questions in a single series with four
control questions. That multiple issue series was repeated three
times and is shown in Figure 2.

Crime 1: Theft of a "Classified" Document.

IR 1. Is today _____?

SR 2. Do you intend to answer truthfully each question on this test?

CQ 3. Prior to coming on active duty, did you ever steal anything from a member of your family?

RQ 4. Did you steal that classified document?

CQ 5. Prior to 1988, other than what you told me about, did you ever steal anything?

RQ 6. Do you know where that classified document is now?

CQ 7. While living in _____, did you ever steal anything from someone who trusted you?

Crime 2: Photographing "Classified" equipment.

IR 1. Is today _____?

SR 2. Do you intend to answer truthfully each question on this test?

CQ 3. Prior to coming on active duty, did you ever violate the trust of a family member?

RQ 4. Did you photograph that classified equipment?

CQ 5. Prior to 1988, other than what you told me, did you ever violate anyone's trust?

RQ 6. Do you know where any photographs of that classified equipment are now?

CQ 7. While living in _____, other than what you told me about, did you violate the trust of a friend?

Crime 3: Sabotage, the destruction of "Classified" equipment.

IR 1. Is today _____?

SR 2. Do you intend to answer truthfully each question on this test?

CQ 3. Prior to coming on active duty, did you ever damage anyone's personal property?

RQ 4. Did you smash that piece of classified equipment?

CQ 5. While living in _____, did you damage anything?

RQ 6. Do you know what was used to smash that piece of classifed equipment?

CQ 7. Prior to 1988, did you ever damage any public property?

Figure 1. The three question series presented to the single issue subjects.

```
IR   1.   Is today _____?

SR   2.   Do you intend do answer truthfully each question on this test?

CQ   3.   Before joining the Army, did you ever steal anything from a
          store?

RQ   4.   Did you steal the classified document?

RQ   5.   Do you know where that classified document is now?

CQ   6.   Prior to 1988, did you ever steal anything?

RQ   7.   Did you smash that piece of classified equipment?

RQ   8.   Do you know what was used to smash that piece of classified
          equipment?

CQ   9.   While in high school, did you ever damage anything?

RQ  10.   Did you photograph that classified equipment?

RQ  11.   Do you know where any photographs of that classified equipment
          are now?

CQ  12.   Between your 13th and 18th birthday, did you ever violate the
          trust of another?
```

Figure 2. The question series presented to the multiple issue
subjects.

Regardless of the test outcome, no interrogation or
additional testing was conducted. The charts were numerically
scored by the examiner immediately following the test using the
scoring rules taught at DoDPI. The scores for each relevant
question were summed across the four channels and the three
charts. Scores of -3 or lower to any relevant question on a test
resulted in a deceptive (DI) outcome. If the test was not
deceptive, but any relevant question had a score between +2 to -2
inclusive, the outcome was inconclusive. Only if the scores on
all relevant questions were +3 or higher was the test categorized
as truthful (NDI).

Results

The overall performance of the original examiners at the
gross classification of individuals as either completely innocent
or guilty to at least one crime is shown in Table 1 for both
Single Issue and Multiple Issue approaches. Decisions with the
Multiple Issue approach on subjects who committed no crimes were
55% correct, 18% incorrect, and 27% inconclusive. Excluding
inconclusives, 75% of these innocent subjects were categorized
correctly. With the Multiple Issue approach, subjects who
committed one or more crimes were called deceptive to at least

one of the crimes 67% of the time, deceptive to none of the crimes 5% of the time, and 28% were reported as inconclusive. Excluding inconclusives, 93% of the Guilty subjects were classified as deceptive to at least one of the crimes. This was statistically significant performance.

Table 1
Decisions of the Original Examiners

	Decision			
Approach Condition	NDI	INC	DI	TOTAL
Multiple Issue Approach				
Innocent	6	3	2	11
Guilty	2	11	26	39
Single Issue Approach				
Innocent	5	6	1	12
Guilty	3	4	31	38
TOTALS	16	24	60	100

Decisions with the Single Issue approach on Innocent subjects were 42% correct, 8% incorrect, and 50% inconclusive. Excluding inconclusives, 83% of these innocent subjects were categorized correctly. With the subjects who committed one or more crimes the Single Issue approach called 82% deceptive to at least one crime, 8% deceptive to no crimes, and 10% were called inconclusive. Excluding inconclusives, 91% of the Guilty subjects were classified as deceptive to at least one crime. This was statistically significant performance.

Statistical tests were conducted to determine if there were significant differences between the Single and the Multiple issue approaches to testing multiple issues, and to see if either of the approaches interacted with guilt and innocence. None of those effects were significant. That is, neither approach outperformed the other with either Innocent or Guilty subjects.

Performance was also examined at the level of accuracy of classifications for single crimes. Since there were no significant differences in classifications for the Approach taken to testing multiple issues, this analysis was collapsed across the Approach factor. Table 2 illustrates the accuracy of classification for each of the crimes with subjects who committed

at least one crime. Neither of the approaches taken in this
experiment significantly discriminated truth and deception at the
level of the single crime. Overall, only 33% of the outcomes on
specific individual crimes were correct.

Table 2
Percent Accuracy for Detecting Which Crime was Committed by
Subjects who Committed at Least One Crime

	NDI	INC	DI
Crime 1			
Truthful on Crime N = 25)	48	32	20
Deceptive on Crime (N = 52)	23	35	42
Crime 2			
Truthful on Crime (N = 26)	12	42	46
Deceptive on Crime (N = 51)	29	41	30
Crime 3			
Truthful on Crime (N = 26)	19	39	42
Deceptive on Crime (N = 51)	33	30	37
Combined			
Truthful on Crime (N = 77)	26	38	36
Deceptive on Crime (N = 154)	29	35	36

The numerical scores were also examined statistically. There were no statistically significant differences between the numerical scores generated with the Single and the Multiple issue approaches to testing. Innocent subjects produced total numerical scores (M = 25.52) that were significantly larger than those produced by Guilty subjects (M = 1.76)

Discussion

There are two important findings in this study. First, there appears to be no advantage to conducting a series of single issue tests over conducting one multiple issue test. There were no statistically significant differences between these two approaches either in the decisions generated or in their respective numerical scores. This finding gives some empirical support to the formats used in many screening and some criminal situations. Second, this experiment suggests that the control question test loses its ability to discriminate truthtellers from deceivers when decisions have to be made at the level of single questions or issues in multiple issue tests. Once deception is attempted to one relevant issue in the test, both the false negative and the false positive error rates increase dramatically, and discrimination is at chance.

The second finding is of considerable importance and it is supported by evidence from the field (Raskin, et al., 1989). These results suggest that a procedure of breaking out certain relevant questions for additional testing and resolution might be very misleading. The false negative rate for calls on single issues in this study was 45%. If a breaking out procedure had been used in this experiment, those 45% of deceptive response to issues would have neither been interrogated or retested. This may be a serious problem. These results suggest that when an individual appears deceptive to one issue, that individual should be interrogated on all of the issues of the test. Breaking out procedures should be used with the knowledge that deception to other issues may well have been missed.

Obviously, additional research needs to be conducted on this problem.

References

Raskin, D. C., Kircher, J. C., Honts, C. R., & Horowitz, S. W. (1989). A study of the validity of polygraph examinations in criminal investigation. Final report, Grant No. 87-IJ-CX-0040. Washington, D.C.: National Institute of Justice.